involves but a relatively small part of the atmosphere but when horizontal convection comes into play as in the case of strong cyclonic circulations the air in situ over any place is being constantly replaced by air drawn from a distance and if that air be moist heavy precipitation naturally results. As the cyclone center moves away the source of the air supply is changed and more frequently than not, in the United States at least, the new supply comes from a colder and drier region. Vertical convection in this air is not probable, the rain ceases and the chain of events which led up to precipitation must be begun de novo. Thus the natural reaction from heavy rain must be a more or less lengthy period of little or no rain.

The second interesting item in the summary is that temperature in Samoa and, inferentially, over the ocean in that part of the Southern Hemisphere during 1926, was higher than usual. And this fact confirms the advices of high temperature in the Argentine that have come to hand.—*A. J. H.*

IMPROVED TABLES FOR DETERMINING TRUE WIND AT SEA

[EDITOR'S NOTE: With reference to the availability of these tables, the following quotation from a letter from Rear Admiral W. A. Moffett, United States Navy, under date of December 14, 1926, is of interest:

"The values have been computed by the Bureau of Aeronautics and compilation of the tables has just been completed. * * * Printed copies will be available later."]

The wind observed aboard a moving ship is the resultant of the true wind and the ship's movement. The observed wind uncorrected for the ship's movement is usually called the apparent wind. The true wind may be found graphically by laying off one vector representing the ship's course and speed expressed in an opposite direction, laying off the apparent wind as a resultant, and joining the termini of the two quantities to determine the second vector which is the true wind. Mechanical devices which operate on the principle of graphical solution have been used from time to time for this purpose. It is doubtful, however, if either the graphical or the mechanical solution of determining true wind is in general as convenient as a set of suitable tables.

The tables most commonly in use among mariners for obtaining true wind is a single page table such as that given in Table 32 of the American Practical Navigator (Bowditch) and the table on page 5 of W. B. 1201 (Marine, 1923), which express wind velocity in Beaufort force. While this brief table is probably satisfactory for wind observations made without the aid of instruments, it does not afford sufficient refinement for wind velocities obtained by anemometer where wind readings are desired to the nearest mile per hour. A further inaccuracy resulting from the use of the single page table expressed in Beaufort force is caused by the occasional changes which have been made in the mile per hour equivalents to the various force numbers. These changes have been made from time to time as modern tests have improved the accuracy of determinations of the equivalents. Each change in equivalents necessitates a change in certain of the corresponding values of true wind. As a result, the tables in use by various observers are not in agreement.

The expansion in late years of the use of anemometers aboard ship and the need of aviation squadrons operating at sea from a base ship for accurate wind data in knots has created a demand for more detailed tables for converting apparent wind to true wind. Tables for this purpose have just recently been completed.

These contain a separate table for each of the 16 points off the bow from which the apparent wind may blow. Each table provides a column for ship's speeds from 5 to 30 knots at 5-knot intervals. The left hand argument in each table contains apparent wind velocities in knots from calm to 30 knots at 2-knot intervals, from 30 to 46 knots at 4-knot intervals, and above 46 at 10-knot intervals up to 100 knots. The tables are arranged to facilitate interpolation to the nearest knot for any apparent wind velocity up to 100 knots. Intermediate values of ship's speed may be readily interpolated also. Tables appended to the bottom of each page make it easy to convert true wind relative to the ship's bow to true wind in compass points—namely, north, north-northeast, and so on. The tables are arranged so that they may be readily used for wind velocities expressed in other common velocity units, such as meters per second. A device is provided which makes it possible to convert directions to the nearest 16 points of the compass if direction to 32 points is not desired.

The advantages of the new tables over the table now commonly used may be summarized briefly as follows: (1) True wind may readily be determined to the nearest knot (when anemometer is available), thus increasing the accuracy of wind data; (2) a greater choice of ship's speeds is available and interpolations for intermediate ship's speeds are facilitated by the arrangement of the tables; (3) the tables may be used for wind expressed in knots, meters per second, Beaufort force, statute miles per hour or "miles per hour," as indicated by the old style four-cup anemometer. This feature furnishes convenient conversion tables for changing from one velocity scale to another; and (4) the tables appearing at the bottom of each page make it easy to change direction relative to the ship's bow to direction in compass points.—*F. W. Reichelderfer*, Lieutenant, U. S. Navy, Aerological Section, Bureau of Aeronautics.

PILOT BALLOON ASCENTS ON THE WEST COAST OF GREENLAND—A CORRECTION

We have received from Dr. P. L. Mercanton of Lausanne, Switzerland, the following note:

In the Monthly Weather Review, October, 1926, p. 247, "Return of the University of Michigan Greenland Expedition of 1926," I read the following statement:

"Study of the upper air by means of the simple pilot balloons has never before been made over or close to the vast ice-cap of Greenland. * * *"

I might be allowed to correct this: Seven pilot-balloon ascents have been made in August, 1912, at Quervain'shavn, West Greenland (lat. N. 69° 46'; long. W. 50° 15'; alt. 10 m.), by the Swiss Expedition across Greenland, 1912–13. The station lay some quarter of a nautical mile to the south of the Ekip Sermia outlet of the Greenland ice cap and about 3.5 miles to the west of its main border. One of the balloons disappeared in the Ci-Str layer more than 7,000 meters high.

This is, however, by no means the maximum height reached. At Godhavn (Disco Island) the Swiss scientist recorded 16,400 and 22,400 meters on the 11th and 12th of March, 1913, and—last but not least—39,000 meters (about 21 miles) on the 25th of February. No conclusive evidence has been brought against this last record.

No doubt Professor Hobbs failed to discover these ascents of Quervain'shavn in the lot of nearly a hundred managed by the Swiss Expedition [1] and will be glad to have his attention drawn to them.

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[1] RESULTATS SCIENTIFIQUES DE L'EXPEDITION SUISSE AU GRÖNLAND, 1912–13, par A. DE QUERVAIN, P. L. MERCANTON, etc. Nouveaux Memoires de las Société helvétique des Sciences naturelles. Vol. LIII, 1920. Suisse.